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ABSTRACT

This research examined the multidimensionality of achievement goals and their hierarchical relations in a sample of 939 students from 6 high schools in New South Wales, Australia. The first year of the study these students completed a survey instrument on school motivation, the Inventory of School Motivation. There will be follow-up for 3 years. Traditional school motivation theories have assumed a Mastery-Performance dichotomy, but this study did not support this assumption. Support for the Mastery-Performance dichotomy would require a low correlation between the two constructs. However, in this study the correlation between the two was substantial. There was strong support for the multidimensional school motivation structure proposed by D. McInerney and others (1997). An appendix contains the study questionnaire. (Contains 2 tables, and 4 figures, 36 references.) (SLD)

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Whereas school motivation research has traditionally emphasized a Mastery-Performance dichotomy, McInerney, Roche, McInerney, and Marsh (1997) have suggested a multidimensional structure of achievement goal orientations. This research examines not only the multidimensionality of achievement goals but also their hierarchical relations. The research emphasizes strong construct validation methodologies and an important extension of goal theory that has proved to be useful in predicting academic success. The findings have the potential of a blueprint for further research on school motivation worldwide and an exemplar of advanced construct validation methodologies.

Theoretical framework

Because of the impact of motivation on educational outcomes, student motivation in schools has become a major field in educational research. The literature on achievement motivation in the past decades typically emphasized a distinction between intrinsic and extrinsic motivation, which were often seen as two extremes of a continuum (Deci & Ryan, 1980, 1985; Lepper & Greene, 1978). Recent theories of achievement motivation, however, have placed more emphasis on the goals of individuals in academic situations that may influence academic behaviors, cognitive processes and achievement.

The importance of students' goal orientations. Differing cognized goals can have dramatic consequences for academic achievement and related behaviors. For example, the development of positive perceptions of self-efficacy and persistence in schoolwork, rather than avoidance of challenging tasks and giving up in the face of failure, will be determined to a large extent by particular achievement goals and self-evaluations in relation to these (Bandura, 1997). Central to a mastery goal is the belief that individual effort leads to success, and that learning has intrinsic value. In contrast, performance goals are essentially "other-referenced". Central to a performance goal is a focus on one's ability relative to others. Students who set performance goals evaluate their competence in terms of how much better they do than others, how much they surpass norms, and whether they can achieve success with little effort. Public recognition for doing better than others through grades, rewards and approval from others is an important element of performance goal orientation. Most recently performance has been partitioned into two goal orientations, performance approach and performance avoidance to help explain some anomalous results produced by an undifferentiated performance goal construct (Elliot, 1997; Urdan, 1997).

Towards a hierarchical, multidimensional goal orientation structure. Increasingly goal theory has moved from a limited focus on mastery and performance to a multidimensional focus (e.g., Ames, 1992; Blumenfeld, 1992; Covington, 1992; Maehr & Anderman, 1993; McInerney, 1992, 1994; 1995; McInerney, McInerney & Roche, 1994a, 1994b, 1995; McInerney, Roche, McInerney, & Marsh, 1997; McInerney & Sinclair, 1991, 1992; McInerney & Swisher, 1995;

Pintrich & Garcia, 1991; Pintrich, Marx, & Boyle, 1993; Schunk, 1996; Urdan & Maehr, 1995; Wentzel, 1991). McInerney et al. (1997), for example, considered five goals, two extrinsic rewards and three sense of self variables in their research. Although the extension of the school motivation literature from a presumed Mastery-Performance dichotomy to a multidimensional goal orientation structure has been an important advancement in this field, the perspective remains analogous to looking at individual trees rather than at the whole forest. Research in the area of achievement goals will be of limited theoretical and applied value unless a holistic picture of the structure of goal orientations, rather than its separate fragments, is visible. For example, the multi-construct goal model of school motivation proposed by McInerney et al. (1997) can be viewed as a higher-order structure consisting of three general goal dimensions (task-effort(mastery), ego(performance), and social solidarity(social), each subsuming more specific goal orientations. For purposes of this study we are considering the desire for extrinsic or token rewards as a performance motivational goal, although it is not usually included as such in previous goal theory research. It is also possible that these general dimensions together can explain what is meant by school motivation. Derived to date from extensive empirical investigations, this approach to the conceptualization of school motivation is innovative and has the potential to become an heuristic theory in the field through its modeling of what the goal constructs mean and how they are related to one another in school contexts.

Although McInerney et al. (1997) suggested that each motivational dimension can be further divided into more specific psychological constructs, neither McInerney nor any other researchers have empirically tested this potentially important hierarchical and multidimensional representation of the academic goal orientations. Specifically, for example, performance goals may be an inclusive representation of more specific goals such as praise, token, power, etc. whereas social goals may include social concern and social dependence.

The aims of the research are therefore:

- to examine the hierarchical, multidimensional structure of school motivation,
- to develop a valid and reliable measure of school motivation, and
- to empirically scrutinize the meaning of school motivation,

Validation of the goal orientation constructs. An important first goal in the present research is the establishment of the validity of the structure of goal orientation constructs that are likely to be both hierarchical and multidimensional. Without first validating this goal orientation structure, any claim of the relations between goal orientations and academic outcomes will become dubious. Thus this research emphasizes an application of advanced construct validation approaches. The potential outcome of the research is a hierarchical, multidimensional structure of achievement goal orientations that may constitute not only a blueprint for future research in academic motivation and related constructs, but also provide methodological guidelines for further research in this field.

Validating a Hierarchical, Multidimensional Goal Orientation Structure. McInerney et al. (1997) assumed four major dimensions (one being extrinsic rewards which in this research we have subsumed into performance) to represent seven specific constructs (striving for excellence, competition, power, affiliation, social concern, recognition and token rewards), each representing a specific goal orientation that is distinguishable from other specific constructs. However, McInerney et al. (1997) did not test the relations between the dimensions and the specific constructs. In this research we propose not only a further emphasis on the multidimensionality of goal orientations by defining even more specific goal constructs, but also propose a strong hierarchical relation between the general and specific goal constructs. Thus this proposed hierarchical, multidimensional model describes goal orientations as a range of at least nine specific goals (effort, task, competition, power, praise, token rewards, feedback, social concern, social dependence) which can be represented by the general goal orientation dimensions described by McInerney et al. (1997). Whereas the nine specific

goal constructs are derived from multiple measured indicators, the three general goal orientation constructs (Maastery, Performance and Social) can be either measured or derived as a higher order factors from the specific constructs.

An Innovative Approach to Testing the Meaning of Goals. Researchers have typically used exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) to validate the hypothesized multiple dimensions of goal orientations. Analyses based on these techniques have led to the development of multidimensional instruments for measuring goal orientations, such as the McInerney et al. (1997) ISM. However, whether the multidimensional measures really reflect students' goals in each respective dimension has never been tested. Thus despite well documented validity based on EFA or CFA supporting the multidimensional nature of school motivation and the distinctiveness of the goal orientation constructs, there is still the serious issue of whether these constructs mean what they are assumed to mean. A scrutiny of the meaning of the latent goal orientation constructs is possible if an independently measured global goal construct for each dimension is added to the model and correlated to its corresponding higher order construct. If the three dimensions (viz, mastery, performance and social) really mean the goals in three distinct areas, then the correlations between the independently measured global constructs should have a close to perfect correlation with the general goal constructs derived from the specific goal constructs. This innovative approach to validating the meaning of a latent construct has been demonstrated by Lau, Yeung, Jin, & Low (1999) and Yeung, Chui, Lau, McInerney, Suliman, and Russell-Bowie (in press) in showing the equivalence of a global self-concept measure to a higher order self-concept construct derived from several first-order factors. This approach has proved to be a particularly strong test of the validity of the factor structure in question.

Method

The Sample: The sample was selected to reflect a variety of cultural groups differing in perceived success at school and achievement motivation. They were drawn from 6 high schools in New South Wales Australia. In the first year of the study all students at each school in Years 7 to 9 participated by completing a survey instrument on school motivation (N=939). As part of a longitudinal study these will be followed-up for three years. In effect, those students recruited in Year 7 will be in Year 9 in the last year of the study, while those recruited in Year 9 will be in Year 11. The first wave of data has already been collected and is reported in this paper. The high school students (52.8% boys) responded to 82 items in a survey. After listwise deletion of missing data, the analysis used a sample of 754 students who had complete data.

Measures: The Inventory of School Motivation (Revised) (ISMR) was used to collect the psychometric data. The original ISM has been revised to take account of the earlier analyses (reported in McInerney et al., 1997 and other places). In effect, all original items that defined scales equivalently across a range of groups (i.e., controlling for invariance of factor loadings across groups) were retained. Other items were discarded. To this group of items a number of other items have been added to investigate their psychometric properties and to strengthen some of the scales. Also added are a bank of items defining general motivation and a bank of items measuring math self-concept, English self-concept and general academic self-concept. There are nine scales represent nine specific goal orientations:

Effort. 7 items ask about the students' effort orientation.
Task. 4 items as about students' task orientation.
Praise. 5 items ask about students' orientation toward praise from teachers.
Feedback. 7 items ask about students' orientation towards marks and verbal feedback.
Competition. 8 items ask about students' orientation towards competition.
Power. 7 items ask about students' orientation to be a leader.
Token. 7 items ask about students' orientation toward receiving rewards.
Social Concern. Five items ask about students' social concern for peers.

Social Dependence. 6 items ask students' about social dependence on peer relations.

There are also three general motivation scales:

General Mastery. 5 items ask about students' Mastery motivation.

General Social. 5 items ask about students' Social motivation.

Overall Motivation. 8 items ask about students' overall school motivation.

The students responded to each item on a 5-point scale (1 = disagree to 5 = agree). The responses to the items were coded such that higher scores reflected higher levels of motivation.

Statistical Analyses

A series of structural equation models (SEM) were tested. We first examined the reliability and tested the fit of a one-factor congeneric model for each of the 12 a priori scales. The items of each specific orientation scale were then averaged to form an indicator for each of three motivation dimensions. For subsequent models to be identified, we needed at least three indicators for each a priori factor in each model. Thus the scale means of Effort and Task together with the scale mean of General Mastery yielded three indicators to form a Mastery factor. Praise, Feedback, Competition, Power, and Token were posited to form a Performance factor. The scale mean of Social Concern and Social Dependence, together with the scale mean of General Social yielded another three indicators to form a Social factor (Figure 1).

The conduct of SEM has been described elsewhere (e.g., Bentler, 1990; Bollen, 1989; Byrne, 1998; Joreskog & Sorborm, 1993; Marsh, Balla, & Hau, 1996; Marsh & Hocevar, 1985; Pedhazur & Schmelkin, 1991) and is not further detailed here. All analyses throughout this paper were conducted with the SPSS version of PRELIS and LISREL using maximum likelihood procedures (Joreskog & Sorbom, 1988). The goodness of fit of models is evaluated based on suggestions of Marsh, Balla, and McDonald (1988) and Marsh, Balla, and Hau (1996) with an emphasis on the Tucker-Lewis index (TLI), but we present also the chi-square test statistic and the relative noncentrality index (RNI).

The one-factor congeneric models were based on a 82 x 82 covariance matrix for the 12 scales (see Appendix). Each scale was tested to fit a one-factor model with or without correlated uniquenesses. A model was considered to fit the data if the TLI > .9. Models testing a three-dimension motivation structure were based on a 19 x 19 covariance matrix (11 scale means + 8 General Motivation items).

In sum, the following models were tested:

Models 1 to 12. These 12 models tested the fit of each of 12 scales.

Model 13. This model tested the ability of the 11 scales to form 3 motivation dimensions. Using the mean scores of each scale, Effort, Task, and General Mastery were posited to load on a Mastery factor. Praise, Feedback, Competition, Power, and Token were posited to load on a Performance factor. Social Concern, Social Dependence, and General Social were posited to load on a Social factor. However, because Praise and Feedback are necessarily also a reflection of a mastery orientation, they were posited to also load on the Mastery factor. This model did not include any correlated uniqueness.

Model 14. This model was similar to Model 13 but included three correlated uniquenesses (1 between General Mastery and General Social, 1 between Competition and Power and 1 between Social Dependence and General Social). This model was expected to provide a better fit than Model 13. Support for a hierarchical representation of school motivation requires Model 13 and 14 to provide reasonable model fits and to display significant factor coefficients relating the scales to their respective motivation dimensions. Support for a multidimensional motivation structure requires Model 13 and 14 (Figure 1) to provide a better fit than respective models that posit a single factor derived from the 11 scales (Figure 2).

Models 15 and 16. These were models corresponding to Models 13 and 14, but positing a single factor derived from the 11 scales. These models were expected to provide a poorer fit than their respective multidimensional models 13 and 14.

Model 17. This model tested the ability of the three dimensions in Model 14 to form a higher order factor. The ability of the three factors to form a single second order factor with statistically significant paths from the second order to the first-order factors would provide further support for a hierarchical representation of a school motivation structure (Figure 3).

Model 18. Even if Model 17 supported a hierarchical representation of school motivation, it would be unclear if the higher order factor would be equivalent to an overall measure of school motivation. Model 18 tested this equivalence by examining the correlation between the higher order factor derived from three major motivation dimensions and the separately measured overall motivation factor (Figure 4).

Results and Discussion

Preliminary Analysis

The alpha reliability estimates for the 12 scales were good (αs from .62 to .85). The goodness of fit of each model tested in the present study is presented in Table 1. Each one-factor congeneric model (Models 1 to 12) provided a reasonable fit to the data. On the basis of the good reliability and model fit for each scale, 11 indicators were formed by averaging the items of each scale for the three major motivation dimensions.

Models 13 and 14: A Multidimensional Model

Both Models 13 and 14 (Figure 1) provided a reasonable fit to the data (TLI = .87 and .91, respectively). Model 14 with three correlated uniquenesses did better than Model 13 without correlated uniquenesses. The factor coefficients were all statistically significant (.35 to .81 for Model 13 and .30 to .83 for Model 14). The correlations among the three derived factors were moderate (rs from .39 to .66 for Model 14) and were therefore clearly distinguished from each other. These results support a multidimensional structure of school motivation. Subsequent models were based on the structure of Model 14.

Models 15 and 16: A Unidimensional Model

These models tested the ability of the 11 scales to form a single motivation factor (Figure 2). Similar to Models 13 and 14, Models 15 and 16 differed in that Model 16 had three correlated uniquenesses included in the model. Model 15 did not fit as well as the corresponding multidimensional model 13 (TLI .62 vs. .87) and Model 16 did not fit as well as the corresponding multidimensional model 14 (TLI .71 vs. .91). These results further support the multidimensional models.

Models 17: Higher Order Factor Model

Model 17 (Figure 3) had a TLI value equivalent to Model 14. The factor coefficients and factor correlations for the first-order factors were similar to those for Model 14. The paths from the higher order factor to the three first-order factors were all statistically significant (βs from .53 to .91). These results provided support for a higher order factor representing the three first-order factors derived from 11 indicators.

Models 18: Meaning of the Higher Order Factor

Model 18 (Figure 4) examined the meaning of the higher order factor in Model 18 by correlating it to a separately measured Overall Motivation construct derived from eight response items. The solution of Model 18 is presented in Table 2. All the factor coefficients for the first-order factors were statistically significant. The factor correlations among the first-order factors were mostly moderate (rs from .26 to .88), with the correlation between Mastery and Overall Motivation being the highest.

The paths from the higher order factor to the Mastery, Performance and Social factors were statistically significant (βs = .97, .39, and .66, respectively). Most importantly, the correlation between the higher order factor and the separately measured Overall Motivation construct was greater than .9, which indicated that the higher order factor derived from the three major motivation dimensions reflecting the 11 specific motivation scales may not be easily distinguished from the

separately measured Overall Motivation construct. These results provided good support for not only the hierarchical structure of school motivation, but also reasonably good validation of the meaning of the higher order construct as similar to an Overall Motivation construct.

Discussion

Traditional school motivation theories have assumed a Mastery-Performance dichotomy. However, the present study did not seem to support this assumption. Support for the Mastery-Performance dichotomy would require a low—even near zero—correlation between the two constructs. The correlation between the two constructs was, however, substantial in the present study (r= .38), providing no support for the assumption. Instead, there was strong support for the multidimensional school motivation structure proposed by McInerney et al. (1997). The specific goal orientations considered in the present study had only moderate correlations among one another. These specific goal orientations could be categorized into three major dimensions consistent with expectations based on a multidimensional perspective. In contrast, a unidimensional model did not explain the relations among the goal orientations as well as the multidimensional model. Furthermore, the data also supported a hierarchical relation among the specific constructs such that the three dimensions (Mastery, Performance, and Social) representing the specific orientations were sufficiently related to form a higher order Overall School Motivation construct. These results provided empirical support for a hierarchical, multidimensional model of school motivation proposed by McInerney et al. (1997).

A clear understanding of the hierarchical and multidimensional structure of school motivation is important. Whereas the study of goal orientations from a multidimensional perspective would be fruitful because of the advantage of more precise investigations of the relations of each goal orientation to specific educational outcomes, a clear understanding of the relations among the goal orientations themselves from a hierarchical perspective would provide a better picture of the whole forest. Thus, whereas recent studies have focused more on the trees than on the forest, the proposed hierarchical, multidimensional model of school motivation might enable a better view of both the trees and the forest, and perhaps provide a blueprint for future research.

A limitation of the present analysis lies with the use of scale means of each specific goal orientation with an assumption of their ability to form distinct specific goal orientations. Although McInerney et al. (1997) have given strong support for this assumption, further research investigating the hierarchical relations of these goal orientations should test this assumption. On the other hand, a strength of the present analysis is the application of SEM in which a separately measured Overall School Motivation factor was included in a higher order factor model to test the meaning of the higher order motivation construct. In traditional tests of a hierarchical structure, researchers may test either the ability of the specific orientation constructs to form a higher order factor or the paths from a measured Overall motivation factor to the specific orientation factors. In either case, it may not be clear whether the higher order factor and the Overall motivation factor would carry a similar meaning. The present application, based on Lau, Yeung, Jin, & Low (1999) and Yeung, Chui, Lau, McInerney, Suliman, and Russell-Bowie (in press), provided support that the higher order factor would not be easily distinguishable from an Overall School Motivation construct. This strong validation of the meaning of a higher order construct may be useful also in other areas of research. In the present study, this approach has provided reasonably strong support for a hierarchical, multidimensional structure of school motivation.

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Table 1. Goodness-of-fit Summary for Models

Model	$\chi 2$	df	TLI	RNI	Null $\chi 2$	df	F.L.
1-factor Congeneric Models							
1. Effort from 7 items, no CU	35.86	14	.97	.98	1256.01	21	.38-.70
2. Task from 4 items, no CU	13.01	2	.90	.97	3251.19	6	.39-.72
3a. Competition from 8 items, no CU	226.58	20	.85	.89	1985.60	28	.48-.75
b. Competition from 8 items, 1 CU	88.18	19	.95	.97	1985.60	28	.42-.76
4. Power from 7 items, no CU	107.12	14	.91	.94	1642.50	21	.52-.73
5. Praise from 5 item, no CU	24.43	5	.97	.98	1145.61	10	.65-.77
6a. Feedback from 7 items, no CU	97.11	14	.83	.89	760.14	21	.34-.56
6b. Feedback from 7 items, 1 CU	54.70	13	.91	.94	760.14	21	.34-.56
7. Token from 7 items, no CU	98.24	14	.91	.94	1456.04	21	.57-.71
8. Concern from 5 items, no CU	12.69	5	.97	.98	502.48	10	.34-.79
9a. Dependence from 6 items, no CU	309.87	9	.68	.81	1571.33	15	.48-.76
9b. Dependence from 6 items, 1 CU	48.77	8	.95	.97	1571.33	15	.50-.77
10. General (Gen) Mastery, 5 items	19.27	5	.96	.98	684.23	10	.41-.72
11a.Gen Social, 5 items, no CU	134.86	5	.73	.86	963.70	10	.34-.81
11b.Gen Social, 5 items, 1 CU	2.41	4	1	1	963.70	10	.30-.82
12a.General Motivation, 8 items, no CU	212.45	20	.84	.89	1730.07	28	.38-.77
12b.General Motivation, 8 items, 2 CU	103.21	18	.92	.95	1730.07	28	.37-.74
SEM Models							
13. Multidimensional (Figure 1), no CU	391.97	39	.87	.91	3934.95	55	
14. Multidimensional (Figure 1), 3 CU	265.04	36	.91	.94	3934.95	55	
15. Unidimensional (Figure 2), no CU	1233.51	44	.62	.69	3934.95	55	
16. Unidimensional (Figure 2), 3 CU	883.00	41	.71	.78	3934.95	55	
17. Higher order (HO) factor (Fig. 3)	265.04	36	.91	.94	3934.95	55	
18. Meaning of HO factor (Fig. 4)	663.00	141	.90	.92	6347.54	171	

Note: RNI= Relative noncentrality index. TLI= Tucker-Lewis index. CU = correlated uniquenesses. N = 754.

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Table 2.

Solution of Model 18

Variables	Mastery	Perform	Social	GenMotiv	Hofactor	Uniqueness
Factor Coefficients						
Effort	.84*	--	--	--	--	.30*
Task	.73*	--	--	--	--	.46*
Gen Mastery	.76*	--	--	--	--	.42*
Praise	.30*	.64*	--	--	--	.37*
Feedback	.42*	.60*	--	--	--	.27*
Competition	--	.67*	--	--	--	.55*
Power	--	.73*	--	--	--	.43*
Token	--	.79*	--	--	--	.38*
Concern	--	--	.85*	--	--	.28*
Dependence	--	--	.41*	--	--	.83*
Gen Concern	--	--	.47*	--	--	.32*
Gen Motiv 1	--	--	--	.47*	--	.78*
Gen Motiv 2	--	--	--	.47*	--	.78*
Gen Motiv 3	--	--	--	.43*	--	.78*
Gen Motiv 4	--	--	--	.68*	--	.81*
Gen Motiv 5	--	--	--	.64*	--	.54*
Gen Motiv 6	--	--	--	.65*	--	.60*
Gen Motiv 7	--	--	--	.57*	--	.58*
Gen Motiv 8	--	--	--	.65*	--	.68*
Path Coefficients						
Mastery	--	--	--	--	.97*	
Perform	--	--	--	--	.39*	
Social	--	--	--	--	.66*	
Factor Correlations						
Mastery	--					
Perform	.38*	--				
Social	.64*	.26*	--			
General Motiv	.88*	.36*	.60*	--		
HO factor	.97*	.39*	.66*	.90*	--	
Residuals	.05*	.84*	.56*	1	1	

Note: N= 754. The model is shown in Figure 4. Parameters estimates are completely standardized. *p < .05.

Gen = General. Motiv = Motivation.

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Appendix

Effort Alpha = .79

1. I don't mind working a long time at schoolwork that I find interesting.
2. I try hard to make sure that I am good at my schoolwork.
3. When I am improving in my schoolwork I try even harder.
4. The harder the problem the harder I try.
5. I try hard at school because I am interested in my work.
6. I try hard to try to understand new things at school.
7. I am always trying to do better in my school work.

Task Alpha = .62

1. I like being given the chance to do something again to make it better.
2. I try harder with interesting schoolwork.
3. I like to see that I am improving in my schoolwork.
4. I need to know that I am getting somewhere with my schoolwork.

Competition Alpha = .85

1. Winning is important to me.
2. Coming first is very important to me.
3. I want to do better than my friends in class.
4. I like to compete with others at school.
5. I work harder if I'm trying to be better than others.
6. I want to do well at school to be better than my classmates.
7. I am only happy when I am one of the best in class.
8. I like trying to be better than someone else at schoolwork.

Power Alpha = .84

1. I work hard at school so that I will be put in charge of a group.
2. I want to feel important in front of my school friends.
3. At school I like being in charge of a group.
4. It is very important for me to be a group leader.
5. I work hard at school because I want the class to notice me.
6. I work hard because I want the teacher to think I'm important.
7. I often try to be the leader of a group.

Praise Alpha = .81

1. Praise from my teachers for my good schoolwork is important to me.
2. Praise from my friends for good schoolwork is important to me.
3. At school I work best when I am praised.
4. I want to be praised for my good schoolwork.
5. Praise from my parents for good schoolwork is important to me.

Feedback Alpha = .69

1. When I get good marks I work harder at school.
2. Getting good marks is everything for me at school.
3. Marks are the best way to know that you've done well at school.
4. Having other people tell me that I did well is important to me.
5. I like to be encouraged for my schoolwork.
6. I like my teacher to show my work to the rest of the class.
7. Having people notice my good schoolwork is really important to me.

Token Alpha = .82

1. I work best in class when I can get some kind of reward.
2. I work hard in school for rewards from the teachers.
3. I work hard at school for presents from my parents.
4. Getting a reward for my good schoolwork is important to me.
5. Getting merit certificates helps me work harder at school.
6. Praise for good work is not enough, I like a reward.
7. If I got rewards at school I would work harder.

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Social Concern Alpha = .64

1. It is very important for students to help each other at school.
2. I like to help other students do well at school.
3. I care about other people at school.
4. I enjoy helping others with their schoolwork even if I don't do so well myself.
5. It makes me unhappy if my friends aren't doing well at school.

Social Dependence Alpha = .81

1. Some of my friends help me with my schoolwork.
2. My friends help me with my schoolwork.
3. It's important to me to have my friend's help with schoolwork.
4. It's important for my friends to be proud of my schoolwork.
5. Working with my friends at school improves my schoolwork.
6. My friends help me to work hard at school.

General Mastery Alpha = .71

1. I am most motivated when I see my work improving.
2. I am most motivated when I am good at something.
3. I am most motivated when I am solving problems.
4. I am most motivated when I am becoming better at my work.
5. I am most motivated when I am confident that I can do my schoolwork.

General Social Alpha = .74

1. I am most motivated when I work with others.
2. I am most motivated when I am in a group.
3. I am most motivated when I work with friends at school.
4. I am most motivated when I am helping others.
5. I am most motivated when I am showing concern for others.

Overall Motivation Alpha = .80

1. Motivation is important to do well at school.
2. When I am motivated I do better at school.
3. Students who are motivated do well at school.
4. I am motivated at school.
5. I feel motivated at school at lot of the time.
6. I feel motivated most of the time at school.
7. I am motivated to study at my school.
8. I am often motivated in my schoolwork.

N = 754

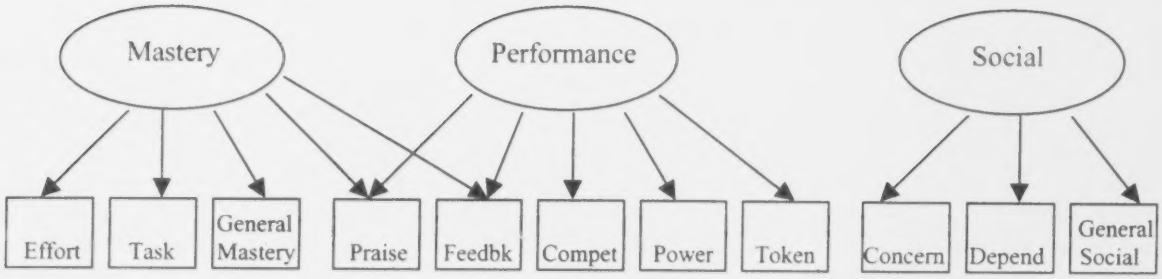

Figure 1. A multidimensional model with 3 motivation dimensions representing 11 scales.

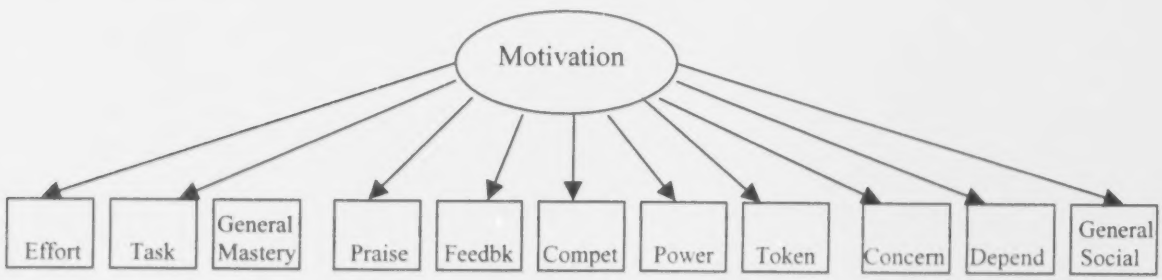

Figure 2. A unidimensional model with 1 single factor representing 11 scales.

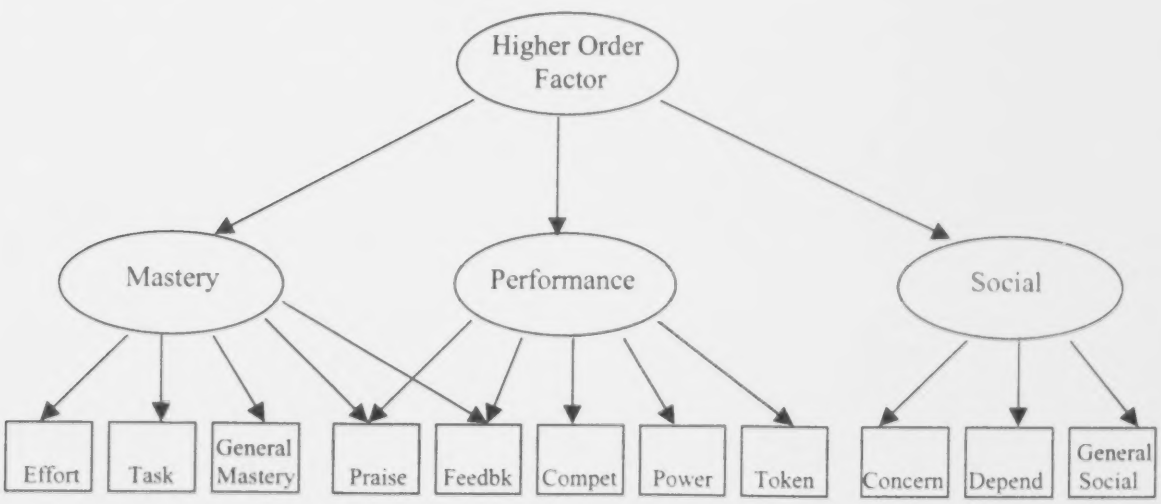

Figure 3. A higher order factor model.

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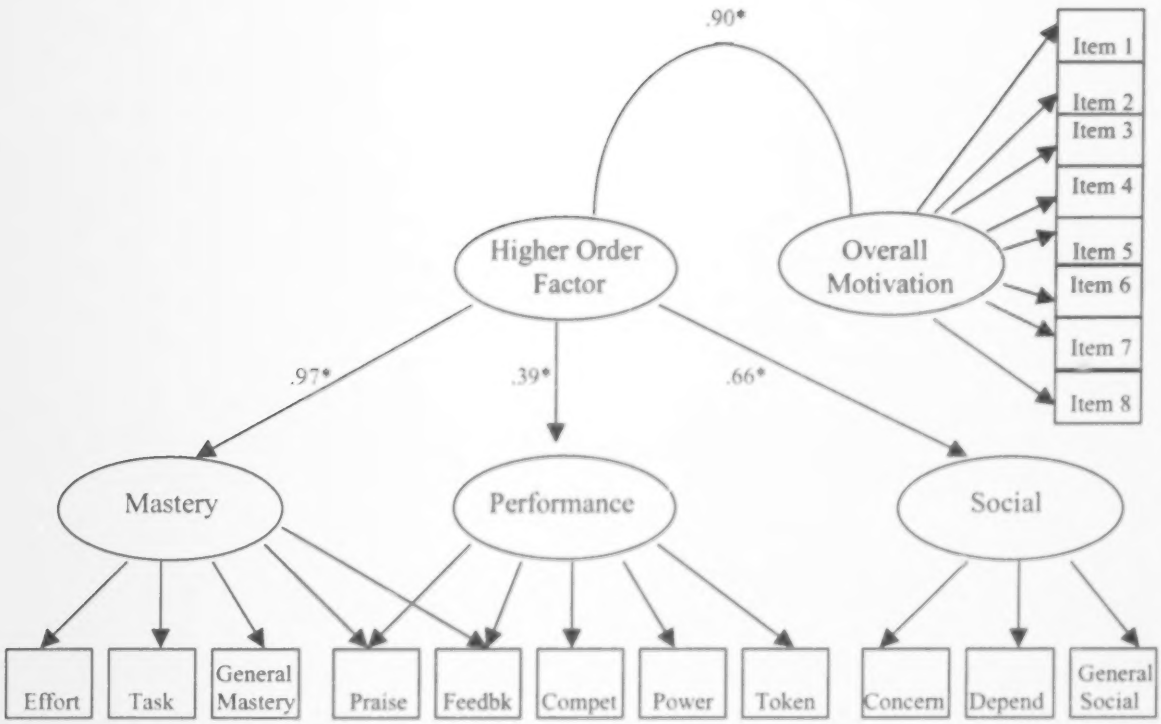

Figure 4. Testing the meaning of the higher order factor by correlating it to a separate Overall Motivation factor.

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